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THE EFFECT OF USING AI APPLICATIONS TO DEVELOP EFL LISTENING COMPREHENSION SKILLS AMONG UNIVERSITY STUDENTS

O EFEITO DA UTILIZAÇÃO DE APLICAÇÕES DE IA PARA DESENVOLVER COMPETÊNCIAS DE COMPREENSÃO AUDITIVA DE EFL ENTRE ESTUDANTES UNIVERSITÁRIOS

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ABSTRACT

The current study sought to determine how well university students' EFL listening comprehension skills may be developed by artificial intelligence (AI) technologies. One hundred students participated in the study, split into two groups: the control group (N = 50), which received traditional education, and the experimental group (N = 50), which received instruction using artificial intelligence systems. The study's instruments included an EFL listening comprehension skills checklist to determine which listening skills are most important for first-year college students to acquire. a pre-post listening skills test to measure students' listening abilities before and after using the chatbot and Duoling AI applications and a correction rubric . A statistical analysis was conducted to confirm the study's hypotheses. Findings of the study revealed that the experimental group students' EFL listening skills were enhanced as a result of using the Artificial Intelligence (chatbot and Duoling).

Keywords: Artificial Intelligence applications, EFL Listening comprehension Skills, university Students.

RESUMO

O estudo atual procurou determinar quão bem as competências de compreensão oral dos estudantes universitários de inglês como língua estrangeira podem ser desenvolvidas pelas tecnologias de inteligência artificial (IA). Participaram no estudo cem alunos, divididos em dois grupos: o grupo de controlo (N = 50), que recebeu educação tradicional, e o grupo experimental (N = 50), que recebeu instrução com recurso a sistemas de inteligência artificial. Os instrumentos do estudo incluíram uma lista de verificação de competências de compreensão oral em inglês como língua estrangeira para determinar quais as competências auditivas mais importantes para os alunos do primeiro ano da faculdade. um teste de competências de audição pré e pós para medir as competências de audição dos alunos antes e depois de utilizarem o chatbot e as aplicações Duoling AI e uma rubrica de correção. Foi conduzida uma análise estatística para confirmar as hipóteses do estudo. Os resultados do estudo revelaram que as competências de compreensão oral de inglês como língua estrangeira dos alunos do grupo experimental foram melhoradas como resultado da utilização da Inteligência Artificial (chatbot e Duoling).

Palavras-chave: Aplicações de Inteligência Artificial, Competências de compreensão oral em inglês como língua estrangeira, Estudantes universitários.

Introduction

Around the world, learning English is an essential task. Among thousands of various languages, it is widely spoken. Individuals frequently invest time, energy, and financial resources in utilising various language-learning systems. This helps students to interact, exchange ideas, locate employment, travel and discover various cultures, in addition to being qualified for a number of scholarships that require a high level of English language skills. Additionally, as English is employed in all facets of life-including business, economics, medicine, education, and policy-learning the language is crucial in the majority of nations. It facilitates individuals' entry into global commerce, which promotes both personal and economic growth.

According to Gilakjani (2016), developing listening comprehension skills is a crucial component of language learning. Pupils desire to comprehend a wide range of multimedia, such as DVDs and the Internet. as well as native speakers. One of the most important skills to master when learning a second language is listening. Kurita (2012) asserts that a significant distinction exists between learners who are more successful and those who are less successful in terms of their aptitude at using hearing as a tool for learning.

According to Hamouda (2013), teaching listening can benefit from the intuitions that the listening comprehension process offers. Students could find it

challenging to acquire listening comprehension skills, which could give teachers a chance to modify their listening exercises into ones that work better. Language learners can improve their comprehension of spoken language by honing their listening comprehension skills. Since their confidence in their ability to understand spoken English will increase, learners will be more motivated to engage in spoken English activities, such as talks with native speakers.

Technology use is becoming a crucial component of training and falls outside of other categories. Learning has been made easier and better with the use of technology. Artificial intelligence is one of the cutting edge technologies used to enhance English language proficiency (Ahmadi, 2018).

The fifth generation of computers has brought forth significant advancements in artificial intelligence (AI). The main goal of AI at the moment is to create intelligent whiteboards that allow students to practise with AI applications. The replication of human intelligence processes by computers, particularly computer systems, is known as artificial intelligence (AI). These processes include reasoning (using standards to arrive at estimated or clear solutions) and learning (data security and utilisation principles) (Ghoneim & Elghotmy, 2021).

Whether they are premium or free apps, digital technology makes it easy to access English learning applications on a mobile device. In addition to being accessible through a browser, English is emphasised as an international language on the game-based language learning platform Duolingo. The program is also available as a mobile app for iOS, Android, and Windows (Mulya & Refnaldi, 2016).

Furthermore, because chatbots can communicate with people using natural language in both textual and audio forms, they are becoming more and more significant in the language acquisition process. Specifically, chatbots can engage with students, encouraging students to improve their foreign language skills and leading relevant discussions in the target language (Bibauw et al., 2019).

The specialised application of AI to university students' EFL (English as a Foreign Language) listening comprehension skills is still largely unexplored, despite the growing interest in deploying AI applications to improve language learning. Thus, the purpose of this study is to determine how well first-year university

students' EFL listening comprehension skills may be developed through the use of AI apps (chatbots and Duoling).

Context of the Problem

The majority of the time, teachers ignore teaching listening since it never grabs their interst and takes up time that could be better spent teaching other subjects, including writing and reading (Ghamry, 2020).

It goes without saying that the majority of English language instructors focus more on teaching writing and reading comprehension and give speaking and listening less attention. Instructors blame this on the structure of the exams, which emphasise reading and writing proficiency (Abdel Khalk, 2011).

It may be concluded from the researcher's teaching experience that EFL listening comprehension abilities are lacking in university students and that there is insufficient attention paid to them. Because they are focused on imparting the fundamental knowledge that would enable pupils to pass written tests, teachers neglect to teach listening skills. Furthermore, it was discovered that there isn't a portion specifically designed to assess listening comprehension abilities.

A During the first term of the academic year 2023/2024, a pilot study was carried out on thirty first-year university stage students at Majmaah University's faculty of education, in order to confirm the study difficulty. The researcher used a listening comprehension exam designed for EFL students. The test's results demonstrated how inadequate the students' EFL listening comprehension abilities were.

Several research (Mansy, 2018; Ghamry, 2020; Ghoneim & Elghotmy, 2021; Al-mawaly & AL-Jamal, 2022) also noted this deficiency in EFL listening skills. According to these findings, teaching English places more emphasis on written work and grammatical concepts than it does on auditory comprehension. Thus, listening comprehension is still being overlooked in English classes. Therefore, there is a need for an efficient method of helping university-level students strengthen their listening comprehension skills.

Statement of the Problem

The problem with the current study is the poor listening comprehension of Majmaah University's first-year EFL students in the education faculty. The goal of this research is to ascertain the extent to which AI apps can assist first-year college students in enhancing their EFL listening comprehension abilities.

Questions of the Study

The following questions were attempted to be addressed by this study:

- What are the EFL listening comprehension abilities needed by first-year college students?

- How can the use of AI tools like chatbots and Duoling improve the listening comprehension skills of first-year university students in English as a foreign language?

Aims of the study

This study aims to

- Ascertain the EFL listening comprehension abilities needed by first-year college students.
- Determine the ways in which first-year university students might improve their EFL listening comprehension abilities via the usage of AI apps.

Hypotheses of the study

1) There would be a statistically significant difference between the mean scores of the experimental group and the control group on the posttest for overall EFL listening ability (literal, critical, inferential, creative preferring the experimental group.

Significance of the study

The following parts of the current study may be important to EFL teachers, students, curriculum developers, and researchers:

1. Teachers of English as a foreign language: The present study has the potential to:

a. Give educators access to artificial intelligence tools that enhance their students' EFL listening comprehension.

b. Provide students with the resources they need to integrate technology into their studies.

2. Learners: They might benefit from this study in the following ways: a. Become more self-assured in their EFL listening abilities.

b. Engage in interactive listening by using the apps for artificial intelligence.

c. Take ownership of their education by using AI technologies in a supportive setting.

3. Curriculum developers:

The current study may help curriculum designers better comprehend the benefits of technology and artificial intelligence in teaching EFL listening skills. It may also help them understand how to incorporate AI activities into curriculum planning and implementation.

4. Researchers

The goal of the current study is to support future research endeavours aimed at incorporating artificial intelligence into EFL curriculum.

Delimitations of the study

The current study is restricted to:

1. Some EFL listening abilities that jury members have approved are necessary for first-year university students. listening abilities include (literal skills, critical skills, inferential skills, creative skills). AI applications (chatbot and Duoling) to develop listening skills.

2. A group of first year faculty of education students from Majmaah University (100) students.

3. The trial will run during the first semester of the 2023–2024 school year.

Methodology

1) A list of EFL listening skills that first-year university students must possess.

2) A pre-post test on EFL listening abilities is administered to both groups.

Definition of terms

Artificial Intelligence (AI)

According to Hager et al. (2017), artificial intelligence (AI) refers to computer programs that simulate cognitive abilities connected to human personalities, such as learning and critical thinking.

From an operational definition, it is: Software applications (chatbot and Duoling) that employ artificial intelligence methods to carry out particular tasks are known as AI applications. These jobs might be as simple as repetitive ones or as sophisticated as cognitive ones requiring intelligence comparable to that of a person.

Listening comprehension

According to Hamouda (2013), listening comprehension is a cooperative process in which the listener generates meaning. Through the use of grammatical structures, prior knowledge, emphasis and intonation, sound discrimination, and other linguistic or non-linguistic cues, listeners are able to understand oral information.

Operationally, it is described as: the capacity to comprehend and analyse spoken English in educational contexts. It entails paying attention to what is being said, picking out important details, deciphering the speaker's intended meaning, and connecting the new information to what you already know.

Listening Skills in EFL instruction

As the foundation for total language ability, listening abilities are essential to learning and mastering a second language (L2). According to Metruk (2018), they are crucial for studying English as a foreign language (EFL), pointing out that they are a necessary first step towards speaking fluency.

According to Boglarka & Boglárka (2023), listening entails a number of intricate steps, including hearing, creating meaning, negotiating comprehension, and giving empathetic feedback. According to (Du & Man, 2022), understanding ideas, feelings, and intentions involves practice, effort, and active participation. Fundamentally, listening comprehension entails more than just passively receiving information; In order to reconcile perceived meaning with intended meaning, it also requires actively assigning both literal and intended meanings to utterances. As a result, it is essential for promoting clear communication and language learning.

To further elaborate on the importance of listening in language learning, it's critical to acknowledge its complexity. In addition to helping students grasp spoken language, listening proficiency also allows them to decipher nuances, recognise different speech rates, and understand the meanings underlying verbal cues. During listening exercises, students interpret language structures, incorporate background knowledge, and use tactical tools to efficiently extract meaning. Effective listening also encourages communication and empathy, which enables listeners to relate to speakers more deeply and react suitably to their facial expressions (Tuong & Dan, 2024).

Metruk (2018) highlights how important listening skills are outside of the classroom and reiterates how important they are for language competency and clear communication. Extensive listening practice, which involves immersing oneself in authentic language resources outside of traditional learning environments, has been shown to enhance students' performance and attitudes towards language learning. This exercise develops a deeper knowledge of language and its cultural subtleties while also improving listening comprehension. Long-term listening has a powerful persuasive effect, especially when students are given the freedom to choose

materials that interest them. This allows them to be exposed to a variety of language settings and enhances their educational experience.

Deregözü (2021) emphasises the value of listening comprehension strategies, particularly in virtual learning settings with minimal face-to-face interaction. Studies reveal that learners enrolled in remote learning initiatives exhibit rather proficient listening comprehension abilities when learning a foreign language. Gender-based variations in the use of strategies also highlight how crucial it is to modify teaching strategies to take into account a range of learning preferences and styles, including gender-specific issues. Moreover, increasing knowledge of native language listening techniques might help transfer them to the second language (L2), promoting processing that is more similar to native and improving L2 listening comprehension. More listening time in L2 classes, a focus on listening exercises, and the development of conscious listening methods are some recommendations for educators.

In conclusion, communication and language proficiency depend heavily on one's ability to listen. While Duolingo and similar platforms have shown successful in teaching receptive skills, its ability to teach productive skills is still being investigated. When putting good listening comprehension tactics into practice, especially in distance education settings, it is imperative to take individual characteristics, including gender, into account.

Theoretical Foundations of Language Learning Listening Comprehension

The complexity of auditory perception and its multi-layered nature in language learning environments are explained by hypothetical foundations. Mental strategies include the dynamic application of semantic knowledge and the handling abilities required to correctly translate and comprehend auditory input. On the other hand, higher-order mental cycles associated with meta-cognitive systems operate via self-regulation and perception observation, enabling students to modify their listening strategies based on the perceived difficulty of the task or their comprehension level. Furthermore, sociolect-full of feeling approaches play a crucial role in developing students' individual dedication and motivation, which in

turn affects their receptiveness to audible encouragement and overall learning outcomes (Abdolrezapour and Ghanbari, 2021).

Artificial Intelligence in EFL

One of the newest technologies for improving English fluency is artificial intelligence (AI). Since AI apps provide quick updates and rapid developmental assessment, employing them in the classroom is essential for the development of language fluency. Of course, practicing a foreign language necessitates the use of many methods. According to Kim (2020), in order for students' listening abilities to improve, they must be exposed to suitable and authentic listening sources. Working and interacting with robots makes it possible to uphold and realise this perspective; they give students accurate models of language input, regardless of spelling or pronunciation. Robots are essential in raising learners' awareness of the value of studying foreign languages, claim Fryer & Thompson (2019).

El Shazly (2021) adduces that because AI technology integrates word error rate and voice interaction for speech-recognition systems at a rate that is comparable to that of humans, it can also generate more opportunities for learners to actively participate in spoken engagement in the target language. Whitlock et al. (2013) state that Open Essayist is an additional AIED example that uses natural language processing to provide automatic, insightful feedback on draft compositions. With Open Essayist, students can develop self-regulated learning, self-knowledge, and self-awareness by thinking critically about the essays' subject matter. On the other hand, earlier AIED systems were made to evaluate writings and provide students problem-solving guidance.

Abdalkader (2023) claims that linguistic technology, visual aids, simulations, and interactive exercises are all used in artificial intelligence (AI) learning programs to help users determine whether their essay accurately conveys the intended meaning and make any necessary corrections before submitting it for actual evaluation. The design of the system was based on the idea that an essay's coherence and organisation are determined by the content and placement of pertinent phrases. This was achieved through the extraction of key phrases, the identification of the

short phrases that most suggest the content of an essay, and the extraction of summarisation.

However, other research (such as Hernandez-Sellés et al., 2019) suggests that student participation is uncommon when appropriate support isn't provided. AI uses self-learning algorithms and participant data, especially in learner models, to form the optimal group for a specific collaborative task. It's possible that all of the students share interests and are on the same cognitive level. On the other hand, expert facilitation might involve educational initiatives that support students in group projects in addition to knowledge and information sharing. This has led to the investigation of several AI-assisted collaborative learning systems.

Applications of Artificial Intelligence in EFL

Nowadays, companies are vying to offer a wide range of AI applications in English for foreign language learners (EFL). Deep learning and neural networks are key components of the popularity of chatbots, Alexa, Siri, Cortana, and other AI assistants, which number in the millions. Kim (2020) conducted a study to find out how artificial intelligence chatbots can help Korean college students become more proficient in English grammar. For 16 weeks, 70 people participated in the study. The participants' grammar abilities significantly improved after utilising AI chatbots, according to the results.

Another artificial intelligence designed to mimic human speech is called Cleverbot. This chatbot was created by Rollo Carpenter and, according to Shah et al. (2016), has an effective artificial dialogue system that makes it function like a human conversation partner. Torrey et al. (2016) claim that Cleverbot picks up on human responses from real individuals and responds accordingly with ease.

According to Daniels (2015), Cleverbot is among the most well-known chatbot programs. There are 200 questions in it. Upon receiving text input, the chatbot parses the provided texts, correlates them with potential responses, and composes a text response. The entire process appears to be happening automatically, giving the impression that the consumer is speaking with a real person. In a related study, Kim (2020) asserted that interacting with Cleverbot can

improve students' writing skills. In other words, using this chatbot to text can be helpful for writing in English.

Elbot, a different popular chatbot, won the Loebner Prize 2008 For its accomplishments in human-machine interaction, the AI Contest (Shah et al., 2016). Shah et al. (2016) stated that Elbot was deserving of the award because interrogators were certain it was a human. This chatbot, created by Fred Roberts, is not limited to providing a self-contained and specialised collection of FAQs; instead, it engages users in conversation about a wide range of topics through natural language interaction (NLI). Elbot also took on the difficult duty of being knowledgeable about a wide range of subjects. Shah et al. (2016) pointed out that despite this, it still has robotic undertones and is machinelike.

Currently, Chat GPT stands as the most sophisticated chatbot, able to do a wide range of sophisticated activities and respond to intricate enquiries. In terms of generative AI, this ground-breaking chatbot goes above and beyond what is anticipated. Chat GPT can help EFL (English as a Foreign Language) students become more fluent writers in a number of ways (Abdalkader, 2023).

1. Expanding vocabulary: Chat GPT can expose EFL students to a large number of terms and expressions that they might not have previously come across. Students can increase their writing fluency by learning how to employ new words in context by interacting with Chat GPT.

2. Grammar and syntax: Due to extensive training on a vast amount of textual material, Chat GPT possesses a firm command of English grammar and syntax. By interacting with Chat GPT, learners can acquire sentence structure, proper grammar, and syntax for writing.

3. Corrections and feedback: Chat GPT can provide students with instant editing and feedback on their work, helping them to see errors and improve as writers. Furthermore, Chat GPT might provide word choices or suggestions for different wording that could improve the coherence and fluency of students' writing.

4. Writing prompts: To assist EFL learners in honing their writing abilities, Chat GPT can offer writing prompts and recommendations. These writing exercises

can be tailored to the learner's interests and skill level, and they can help them become more confident and fluid in their writing.

Grammarly is an AI-driven platform. According to Taguma et al. (2018), it has over 20 million international users and is a potent digital writing tool. Additionally, Grammarly is accessible on several operating systems for tablets and smartphones. Moreover, Grammarly is automatically compatible with browsers on computers, social media websites, and internet computers. There are two versions available: both the premium and the free version. In the current investigation, the free one was utilised by the researcher.

According to Abdalkader (2023), the Grammarly (AI) program and the Minecraft game are both being developed as instructional aids. Students can explore and engage with the realistic, block-based world of Minecraft. The two primary game types are creative and survival. Players attempt to survive in survival mode by gathering natural resources like farming, mining, animals, and plants and using these resources to complete worthwhile tasks. Additionally, players can utilise building bricks to construct imaginary individuals or locations. Players are free to play in the creative mode without facing any attacks.

According to some studies (Hassani et al., 2013), for example, learning in virtual settings can help students successfully integrate what they've learnt with real-world experiences, even though doing so has always been difficult. Secondly, artificial intelligence applications are fantastic resources that let students interact with people or robots in virtual environments.

Thus, it's evident from the above analysis that a variety of education-related fields are already utilising artificial intelligence (AI) tools, such as content creation, pedagogical approaches, learner assessments, and teacher-student communication. The quality of our educational system, teachers, students, and experts in technology-enhanced learning will all find value in this work, This adds to the corpus of information in the field.

The use of AI in L2 listening pedagogy

The increasing prevalence of artificial intelligence (AI) in nearly every facet of contemporary life has led L2 scholars and practitioners to explore potential applications of AI-driven software for L2 listening training. Self-learning listening comprehension has been facilitated by the usage of AI-integrated multimedia-based apps like Spotify Music, YouTube, Netflix, Tune In radio, and Tune In radio (Suryana et al., 2020). Other virtual personal assistant apps, such as Siri or Alexa, which use artificial intelligence (AI) for speech production and recognition, have also been used to teach English speaking and listening (Dizon, 2020).

Although artificial intelligence (AI) powers apps like YouTube and Netflix, it's vital to keep in mind that these platforms weren't designed to teach or acquire listening comprehension; instead, the AI in these apps merely modifies the user experience. Similarly, while Alexa may be used to some degree in speaking and listening instruction, these platforms were not created with learning support features in mind. Dizon (2020) noted in his research that, predictably enough, Students' listening comprehension did not significantly improve after using Alexa as their virtual personal assistant. This is a result of the program's intended usage not being met. Thus, as said earlier, clever CALL programs designed specifically for L2 listening comprehension need to be

AI's impact on the improvement of listening abilities

The development of listening skills has also been significantly impacted by the quick breakthroughs in artificial intelligence (AI). Artificial intelligence (AI) has drastically changed how people learn and develop their listening skills, especially in the domains of speech recognition and natural language processing (NLP). Hu & Hu (2020) stress that speaking and listening are both necessary for effective communication with others. As a result, during the language learning process, prepared activities that connect the two language skills—such as having discussions and working in pairs while utilising multimedia—should be made. Students can connect and improve their capacity to express themselves clearly during such events.

Xiao et al. (2022) claim that active listening facilitates online text communication in addition to spoken conversation. Through "teamwork," students learn how to collaborate and take on responsibilities. Furthermore, role plays, oral presentations, games, and conversations conducted online can all help to improve the listening environment. Thanks to AI-powered tools and applications, people now have access to personalised language learning apps that evaluate pronunciation, intonation, and understanding and provide real-time feedback and specialised exercises.

Effective listening comprehension begins with developing an understanding of the words and phrases that make up a story, according to Huang and Yoo (2013). In order to improve engagement and comprehension, AI-enhanced podcasts and audiobooks use speech recognition and natural language processing (NLP) to offer interactive features, track progress, and make content recommendations based on listener listening histories. AI-assisted language training has advanced significantly thanks to virtual language tutors and automated speech evaluation systems, which provide students with instant feedback on their speaking and pronunciation abilities as well as safe environments to practise their listening skills. AI is clearly having a positive effect on listening skills, and this trend has great potential for future advancements in communication skills.

In his work, Zhou (2021) addressed the need to strengthen students' listening abilities in order to increase their overall competency in the language. On English tests, The listening skills of the best and worst students can differ significantly. The author cited Chinese school examples to support her assertion that listening comprehension is a key component of the English proficiency test and is rated highly on the Ministry of Education's English proficiency rating scale. It is challenging for teachers to give students more opportunities to develop their listening abilities in the language because the new English teaching reform has significantly reduced the amount of time spent teaching college English in the classroom. Thus, in order to improve learning in the classroom, certain extracurricular teaching techniques are very necessary. The AI teaching and learning platform merely satisfies the need for the time being. However, there are

ethical issues with AI use, including bias and data privacy, as well as challenges with picking up on subtle linguistic differences.

To make matters more complicated, the cognitive sciences are yet unable to precisely define what human capacities are. Artificial Intelligence (AI) systems may have a different structure than human intellectual systems. It is evident that program programmers lack a sufficient understanding of the mental processes required to carry out the task at hand whenever humans perform better than computers at it or when computers require a great deal of processing power to perform the work as well as humans (Abdalkader, 2023).

According to DOGHONADZE (2024), the application of AI to education in general and speaking and listening skill development in particular has the potential to completely transform how students acquire new abilities. Through the provision of prompt feedback, conversation partner simulation, and cross-cultural communication facilitation, artificial intelligence (AI) can effectively and engagingly assist students in the development of their speaking and listening abilities. It will be fascinating to observe how AI technology is incorporated into education to enhance students' learning objectives as it advances.

Artificial intelligence and Listening

Artificial intelligence (AI) voice synthesis technology dramatically enhances students' ability to listen to English by offering accurate pronunciation models, natural-sounding speech, engaging and interactive learning possibilities, and personalised practice and feedback. AI streamlines listening training by raising awareness of phonetic features unique to each language, making tasks like segmentation, speed control, and repetition easier. Teachers can extract specific noises and voice segments from audio materials, adjust playback speed, and enhance listening processes with the use of technologies like AI boards. Through web sites, learners can integrate different media formats (pictures, text, audio, video, etc.) with audio material. With AI boards, students can click on a word to hear it pronounced aloud, see its spelling, access dictionary definitions, or practise pronouncing words correctly. Several studies have indicated that technology- and

internet-based tools and programs can help EFL learners with time restrictions and other speaking issues they encounter in and out of the classroom (Rahimi & Fathi, 2022; Liu, 2024).

Using AI Applications to Improve First-Year University Students' EFL Listening Comprehension Skills

Particularly for university students, artificial intelligence (AI) provides cutting-edge resources to improve listening comprehension in English as a foreign language (EFL). The following are some practical applications for chatbots and Duolingo (Bibauw & Desmet, 2022b) and (Mulya & Refnaldi, 2016):

Chabot Applications (Bibauw & Desmet ,2022b):

1. **Simulated Conversations:** Students can practise listening to a variety of dialects, speaking velocities, and English style by using chatbots to engage them in genuine discussions.
2. **Personalized Feedback:** Chatbots can give pupils instant feedback on their listening comprehension, pointing out areas for development and making recommendations.
3. **Adaptable Difficulty:** Chatbots ensure ongoing challenge and improvement by adjusting the difficulty of talks according to the student's competence level.
4. **Unlimited Practice:** Students have plenty of opportunity to practise listening as they can engage with chatbots at their own pace and as often as necessary.

Duolingo Applications (Mulya & Refnaldi. ,2016):

1. **Structured Listening Exercises:** 1. To train particular listening abilities, Duolingo provides a range of listening exercises, like as dictation, fill-in-the-blank, and multiple-choice questions.
2. **Adaptive Learning:** The software makes sure students are neither overwhelmed nor bored by adjusting the difficulty level of exercises based on their performance.

3. **Gamification:** Due to Duolingo's gamified methodology, learning is made more interesting and inspiring, which motivates students to practise frequently.
4. **Pronunciation Feedback:** Students can enhance their listening accuracy by using Duolingo's pronunciation feedback. Students can enhance their listening accuracy by using Duolingo's pronunciation feedback.

Technique, Tools, and Processes

Study design

This study used a quasi- experimental design, where two intact groups from students were randomly assigned to two equal groups (experimental and control). The researcher developed listening skills through using the AI apps, while the control group used the regular method. A pre-test and an equivalent post-test were given to the two groups before and after the treatment.

1. The EFL comprehension checklist for listening skills

The EFL listening comprehension skills checklist's goal

The purpose of the listening comprehension skills checklist (Appendix A) is to identify the listening abilities that first-year university students need to possess.

An explanation of the EFL checklist for listening comprehension skills

Twenty sub skills from four key categories (literal skills, critical skills, inferential skills, and creative skills) make up the EFL listening comprehension abilities checklist.

The EFL listening checklist's validity

The researcher gave the checklist to a panel of jurors to validate and offer recommendations in order to verify its validity.

2. The listening comprehension test for EFL students

The EFL listening comprehension skills exam's objective

The purpose of the listening skills exam is to gauge the admission level of first-year university students in the aforementioned listening comprehension skills.

Through the test, researchers were able to assess how well AI programs helped students improve their listening comprehension. (See Appendix B.)

An explanation of the EFL test for listening comprehension

There are two variations of the test:

a) The teacher is the subject of the first. It includes the test instructions, written objects, scripts, and spoken stimuli.

b) Students are the target of the second. They must select the correct response and circle it.

The listening test included 20 multiple choice to measures the participants' ability in (literal skills, critical skills, inferential skills, creative skills). It consisted of twenty questions.

Piloting the EFL listening skills test

Twenty first-year university students who were not participating in the study took the test to ascertain how clear the instructions and questions were. The investigation's goals were to:

1. The test instructions' clarity.

2. The exam items' appropriateness given the students' educational background.

3. The test questions' level of complexity or simplicity, ensuring that students could easily understand them.

4. Timing of the test.

The following equation was used to estimate how long it will take to answer each question thanks to the piloting:

The total time spent by all students (920)

Test time is calculated as follows: 4 minutes for test teaching, plus the sum of each student's time (920)÷ test questions (20) = 46.

As a result, the test lasted for fifty minutes.

Scoring the EFL listening test

The total mark of the listening test is “40” marks every question has two marks.

To determine the test's reliability, use the following methods:

- Cronbach's alpha of the listening comprehension test scores to determine reliability statistics

Table 1 – The reliability of the listening comprehension test

Skill	Cronbach's Alpha
Literal Listening Comprehension abilities	0.843
Critical listening comprehension abilities	0.839
Inferential listening comprehension abilities	0.848
Creative listening comprehension abilities	0.846
EFL listening comprehension	0.849

The test's Cronbach's Alpha is 0.849.

Meaning that there is great dependability in the test. The test was deemed reliable based on prior outcomes.

Reliability by re-application method:

Two weeks following the initial administration, the test was administered again, and it was established what the correlation coefficient was between the two administrations' outcomes. The reliability of the test is thought to be gauged by this correlation coefficient. The following table illustrates this:

Table 2 – The correlation coefficient between the scores of the two applications

Skill	Correlation coefficient between the two applications
Literal Listening Comprehension abilities	0.817
Critical listening comprehension abilities	0.826
Inferential listening comprehension abilities	0.835
Creative listening comprehension abilities	0.809
EFL listening comprehension	0.841

Which means the stability of the test and its validity for application.

Validity of the listening comprehension test:

• Internal consistency

Internal consistency was assessed by looking at the correlations between the sub skills and the exam's overall score.

Correlation between sub skills and the total test result is shown in Table (3). Statistics showed that every correlation was significant. This demonstrates the internal consistency of the test.

Table 3 – Correlation between the sub skills and the test's overall score

Sub-skill	Correlation= r	sig
Literal Listening Comprehension skills	0.824**	Significant at (0.01)
Critical listening comprehension skills level	0.836**	Significant at (0.01)
Inferential listening comprehension skills level	0.8134**	Significant at (0.01)
Creative listening comprehension skills	0.829**	Significant at (0.01)

**There is a significant correlation at the 0.01 level.

The statistical model used:

This research depended in analyzing its results on a heptachlor model for analyzing educational research data as it leads to achieving the necessary conditions needed for performing a good statistical analysis and interpreting the results of this analysis. Each hypothesis had been tested by following the seven stages of the model which were as follows; the preliminary analysis, the exploratory analysis, the performativity analysis, the affirmative analysis, the iterative analysis, the frequency analysis and the integrative analysis. SPSS (Statistical Package for the Social Sciences, version18) was used to analyze students' scores.

Results and Discussion

The results and commentary are presented in this section. Tables and figures were used to display the results after the data were processed statically. Second, the study and hypotheses were discussed in relation to the outcomes.

The results

Statistics were used in the handling of the data. Pre- and post-test data for the students were analysed using the Statistical Package for the Social Sciences (SPSS, version 25). The results of the current study were evaluated in view of the inquiry and the following theories:

Equivalent of the two groups

By taking the impacts of the control factors out of the research variables, we can confirm the equivalency of the experimental and control study groups, by controlling these variables and adjusting them or isolating their effect in the post-research results. These variables include the following:

Applying the two research tools to the two research groups before conducting the teaching experiment:

To assess the equivalency of the two groups (the experimental group and the control group) at the pre-test, the independent samples t-test was employed to ascertain the significance of the difference between the mean scores of the experimental group and the control group. In Table 4, the t-values are presented.

Table 4 – The T-Value to Indicate the Distinction Between the Two Groups' Mean Scores

Skills	Group	N	Mean	Std. Deviation	t-value	d.f	sig
Literal Listening Comprehension skills	Experimental	50	3.66	1.08	1.464	98	No Significant
	Control	50	3.32	1.24			
Critical listening comprehension skills	Experimental	50	3.54	1.25	.765	98	No Significant
	Control	50	3.34	1.36			
Inferential listening comprehension skills	Experimental	50	3.28	1.23	.484	98	No Significant
	Control	50	3.16	1.25			
Creative listening comprehension skills	Experimental	50	3.30	1.25	.806	98	No Significant
	Control	50	3.10	1.23			
Overall EFL Listening comprehension	Experimental	50	13.78	2.27	1.752	98	No Significant
	Control	50	12.92	2.63			

The aforementioned table clearly shows that the computed values of "t" were not significant and that there was no difference in the mean scores of the two groups. Table 4 shows that the computed "t" values are not significant. Thus, the two groups—the experimental group and the control group—are equivalent before the research experiment is conducted.

Hypothesis One

There would be a statistically significant difference between the mean scores of the experimental group and the control group on the posttest for overall EFL listening ability, preferring the experimental group.

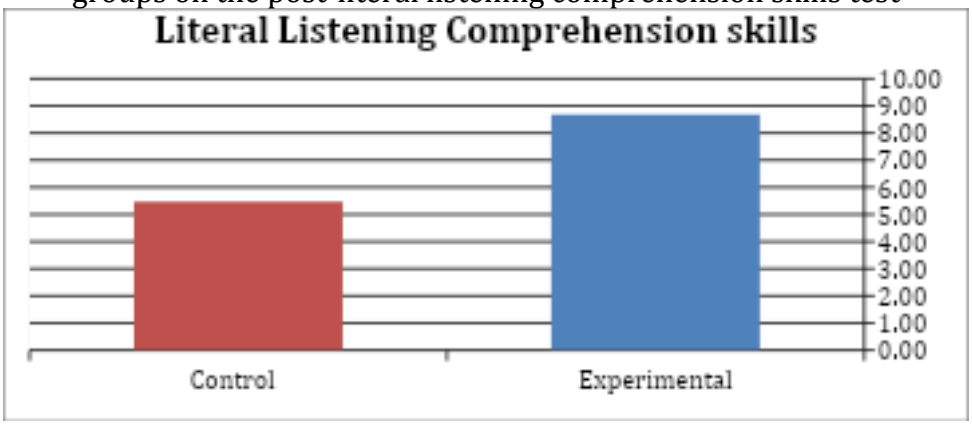
Data were statistically processed in order to confirm this theory. Calculations were made for means, standard deviation, minimum and maximum scores. The t-value for the difference between the two groups' mean scores was determined in order to demonstrate the importance of the discrepancies. Table (5) provides an illustration of this:

Table 5 – t-Value and effect size of both groups

Test	Group	N	Mean	Std. Deviation	t-value	d.f	Sig
Literal Listening Comprehension skills	Experimental	50	8.68	1.06	15.532	98	**Significant at (0.01)**
	Control	50	5.46	1.01			

The experimental group outperformed the control group in Literal Listening Comprehension skills, with a mean score of 8.68 compared to 5.46 in Table 5. After the test was administered, Table 5 shows that the experimental group fared better on the Literal Listening Comprehension skills test than the control group. Furthermore, it demonstrated that the experimental group's grades were more homogeneous (=standard deviation/mean) than those of the control group as a result of using AI apps. Table (5) clearly shows that the computed value of "t" (= 15.532) is higher than the tabular value of "t" with 98 degrees of freedom and significant level "0.01". This shows the difference in mean scores between the two groups. This is represented graphically in figure 1.

Figure 1 – Bar chart showing the average scores for the experimental and control groups on the post-literal listening comprehension skills test



The results' educational significance and effect were examined by calculating the effect size (d) and the value of ETA squared (). Applying the subsequent formula.

$$\eta^2 = \frac{t^2}{T^2 + d.f}$$

Table 6 – Reference standers of (η 2) and (D) values

Test	Effect volume		
	Small	Medium	Large
η^2	0.01	0.06	0.14
D	0.2	0.5	0.8

skills	t-value	d.f	Sig	$^2\eta$	D	Effect size
Literal Listening Comprehension skills	15.532	98	Significant at (0.01)	0.71	3.14	Large

It was fairly significant with an ETA squared of 0.71. In light of this, it can be said that there was a height effect and educational significance for improving and developing Literal Listening Comprehension skills, and that the two groups' exposure to different teaching philosophies was responsible for 71% of the variations in student scores in this domain. 3.14 is the effect size (d).

Hypothesis Two:

There would be a statistically significant difference between the mean scores of the experimental group and the control group on the posttest for EFL literal listening comprehension skills

Data were statistically processed in order to confirm this theory. Calculations were made for means, standard deviation, minimum and maximum scores. The t-value for the difference between the two groups' mean scores was determined in order to demonstrate the importance of the discrepancies. Table 7 provides an illustration of this:

Table 7 – t-Value and effect size of both groups

Test	Group	N	Mean	Std. Deviation	**t-value**	**d.f**	**Sig**
Critical listening comprehension skills	Experimental	50	8.72	1.16	15.048	98	**Significant at (0.01)**
	Control	50	5.44	1.01			

Table 7 shows that, compared to the control group's 5.44 score, the experimental group's mean score for critical listening comprehension abilities was 8.72. Table (7) indicates that the experimental group outperformed the control group on the post-administration Critical listening comprehension skills exam. Furthermore, it demonstrated that the experimental group's grades were more homogeneous (=standard deviation/mean) than those of the control group as a result of using AI apps. It is clear from Table (7) that the calculated value of "t" (= 15.048) is higher than the value of "t" that was tabulated with 98 degrees of freedom and a significance threshold of "0.01." This shows the difference in mean scores between the two groups. This is represented graphically in figure 2.

Figure 2 – Bar chart showing the average scores for the experimental and control groups on the post-critical listening comprehension skills exam

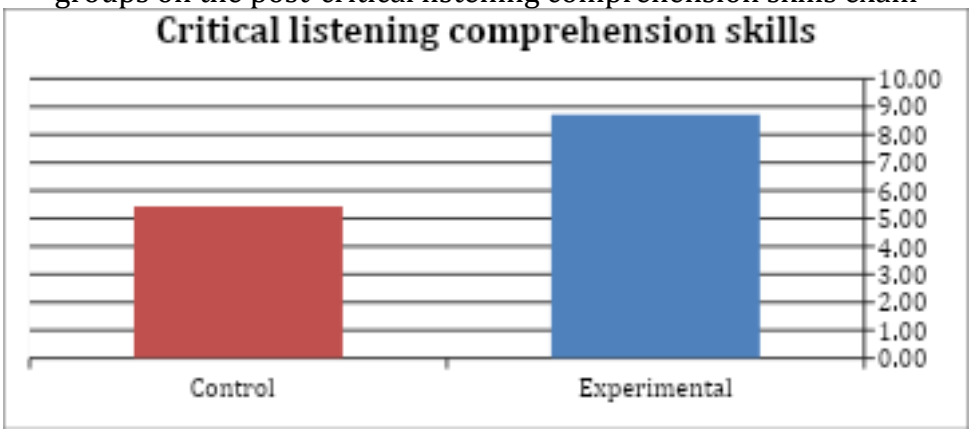


Table 8 – The results' educational significance and effect were examined by calculating the effect size (d) and the value of ETA squared

skills	t-value	d.f	Sig	$^{2}\eta$	d	Effect size
Critical listening comprehension skills	**15.048**	**98**	**Significant at (0.01)**	**0.70**	**3.04**	**Large**

With ETA squared of 0.70, it was practically significant. Accordingly, it can be concluded that there was a height effect and that education was important for enhancing and developing critical listening comprehension skills. The effect size (d) = 3.04 indicates that 70% of the variations in the student scores on the Critical listening comprehension skills could be referred to the different teaching treatments that the two groups were exposed to.

Hypothesis Three:

The mean scores of the experimental group and the control group on the posttest for EFL critical listening comprehension skills would differ statistically significantly in favour of the experimental group.

Data were statistically processed in order to confirm this theory. Calculations were made for means, standard deviation, minimum and maximum scores. The t-value for the difference between the two groups' mean scores was determined in order to demonstrate the importance of the discrepancies. Table (9) provides an illustration of this:

Table 9 – t-Value and effect size of both groups

Test	Group	N	Mean	Std. Deviation	t-value	d.f	Sig
Inferential listening comprehension skills	Experimental	50	8.72	1.07	14.547	98	**Significant at (0.01)**
	Control	50	5.52	1.13			

Table 8 shows that the experimental group outperformed the control group with a mean score of 8.72 for inferential listening comprehension skills, compared to 5.52 for the latter group. Table (9) shows that after taking the Inferential Listening Comprehension Skills Test, the experimental group did better than the control group. Furthermore, it demonstrated that the experimental group's grades were more homogeneous (=standard deviation/mean) than those of the control group as a result of using AI apps. With 98 degrees of freedom and a significance level of "0.01," Table (9) clearly shows that the computed value of "t" (= 14.547) is

higher than the tabular value of "t." This shows the difference in mean scores between the two groups. This is represented graphically in figure 3.

Figure 3 – Bar Chart showing the Mean Scores of the Control and the Experimental Groups in the Post Inferential listening comprehension skills test Administration

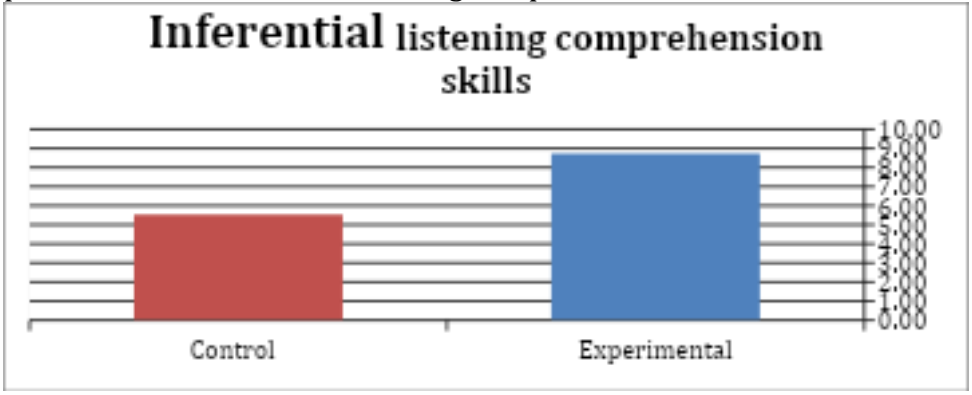


Table 10 – The results' educational significance and effect were examined by calculating the effect size (d) and the value of ETA squared

skills	t-value	d.f	Sig	$^2\eta$	d	Effect size
Inferential listening comprehension skills	**14.547**	**98**	**Significant at (0.01)**	**0.68**	**2.94**	**Large**

With ETA squared of 0.68, it was practically significant. Accordingly, it can be concluded that there was a height effect and that education was crucial for enhancing and developing inferential listening comprehension skills. The effect size (d) = 2.94 indicates that 68% of the variations in the student scores on the inferential listening comprehension skills could be attributed to the different teaching treatments that the two groups were exposed to.

Hypothesis Four:

The mean scores of the experimental group and the control group on the posttest for EFL inferential listening comprehension skills would differ statistically significantly in favour of the experimental group.

Data were statistically processed in order to confirm this theory. Calculations were made for means, standard deviation, minimum and maximum scores. The t-value for the difference between the two groups' mean scores was determined in

order to demonstrate the importance of the discrepancies. Table (11) provides an illustration of this:

Table 11 – t-Value and effect size of both groups

Test	Group	N	Mean	Std. Deviation	**t-value**	**d.f**	**Sig**
Creative listening comprehension skills	Experimental	50	9.02	0.98	17.722	98	**Significant at (0.01)**
	Control	50	5.36	1.08			

Table (11) shows that the experimental group outperformed the control group with a mean score of 9.02 for creative listening comprehension abilities compared to 5.36 for the latter group. According to Table (11), the experimental group fared better on the post-administration Creative listening comprehension skills assessment than the control group. Furthermore, it demonstrated that the experimental group's grades were more homogeneous (=standard deviation/mean) than those of the control group as a result of using AI apps. Table (11) clearly shows that the computed value of "t" (= 17.722) is higher than the tabulated value of "t" with 98 degrees of freedom and significant level "0.01". This shows the difference in mean scores between the two groups. This is represented graphically in figure 4.

Figure 4 – Bar Chart showing the Mean Scores of the Control and the Experimental Groups in the Post Creative listening comprehension skills test Administration

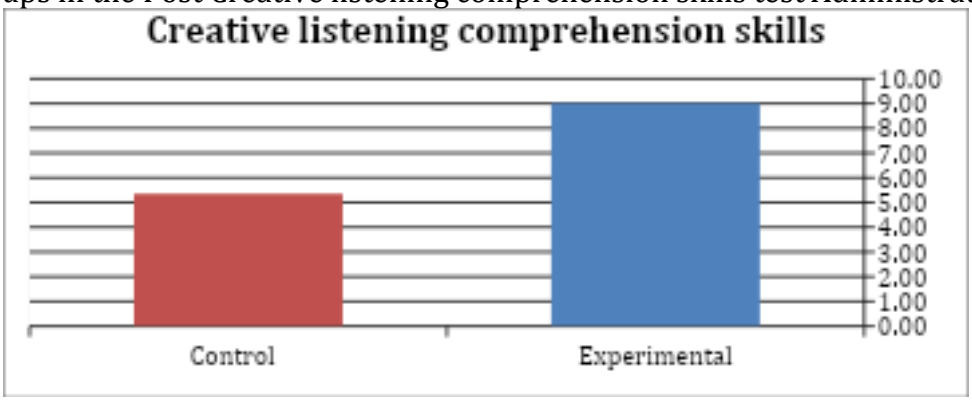


Table 12 – The results' educational significance and effect were examined by calculating the effect size (d) and the value of ETA squared

skills	t-value	d.f	Sig	$^2\eta$	d	Effect size
Creative listening comprehension skills	**17.722**	**98**	**Significant at (0.01)**	**0.76**	**3.58**	**Large**

It was practically noteworthy with an ETA squared of 0.76. This leads to the conclusion that there was a height effect and educational significance for improving and developing Creative listening comprehension skills, and that the two groups' exposure to different teaching philosophies was responsible for 76% of the differences in student scores in this domain. This conclusion is supported by the effect size (d) = 3.58.

Hypothesis Five:

There would be a statistically significant difference in the mean scores of the experimental and control groups on the posttest for EFL creative listening comprehension abilities, favouring the experimental group.

Data were statistically processed in order to confirm this theory. Calculations were made for means, standard deviation, minimum and maximum scores. The t-value for the difference between the two groups' mean scores was determined in order to demonstrate the importance of the discrepancies. Table (13), which illustrates this, shows:

Table 13 – t-Value and effect size of both groups

Test	Group	N	Mean	Std. Deviation	t-value	d.f	Sig
overall EFL listening skills	Experimental	50	35.14	2.07	32.477	98	**Significant at (0.01)**
	Control	50	21.78	2.04			

As per Table (13), the mean score for overall EFL listening abilities in the experimental group was 35.14, which was greater than the score of 21.78 in the control group. The post-administration results of the total EFL listening skills exam are shown in Table (13), which shows that the experimental group fared better than

the control group. Furthermore, it demonstrated that the experimental group's grades were more homogeneous (=standard deviation/mean) than those of the control group as a result of using AI apps. As can be seen from Table (13), which has 98 degrees of freedom and a significant level of "0.01," the computed value of "t" (= 32.477) is higher than the tabular value of "t." This shows the difference in mean scores between the two groups. This is represented graphically in figure 5.

Figure 5 – Bar Chart showing the Mean Scores of the Control and the Experimental Groups in the Post total EFL listening skills test Administration

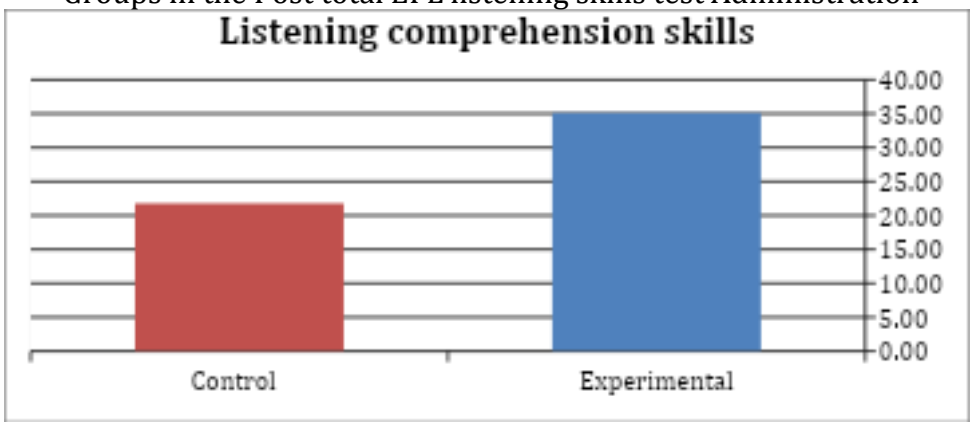


Table 14 – The results' educational significance and effect were examined by calculating the effect size (d) and the value of ETA squared

skills	t-value	d.f	Sig	$^2\eta$	d	Effect size
overall EFL listening skills	32.477	98	Significant at (0.01)	0.91	6.56	Large

Because of its practically substantial ETA squared of 0.91. With this in mind, it can be said that there was a height effect and educational significance for improving and developing overall EFL listening skills, and that the two groups' exposure to different teaching philosophies accounted for 91% of the variations in student scores on the overall EFL listening skills exam. This conclusion is supported by the effect size (d) = 6.56.

The following factors could be to blame for the outcomes:

1) The modules, activities, and courses that the researcher created. Several AI tools and actions were used to allow the students more time to engage in the activities, read the texts and watch the videos, finish the assignments, and double-check their answers under the guidance and aid of the teacher in a purposeful, positive, tranquil, and cheerful atmosphere.

2) The AI-applications increased student participation in the classroom, inspired them, and encouraged a love of learning. Because students are more motivated and involved, lessons are more memorable.

3) The researcher could improve an ideal English learning environment for EFL students using AI applications. This setting would include listening materials that are pertinent to real-world circumstances and hands-on in nature, in addition to supporting classroom learning objectives including guidance, face-to-face connection, and minimum irritation.

4) Students were given immediate feedback from the AI applications, which encouraged them to take ownership of their education and answer questions before determining whether or not they were correct. These programs encouraged and aided in self-learning. Additionally, the "Reset" feature of the programs allowed students to respond to the questions multiple times using various learning modalities and learn more about various approaches to completing the tasks using various tools.

Conclusion

The purpose of the current study was to ascertain how well an AI application could improve the EFL listening skills of first-year university students. Two groups of participants were formed: the experimental group and the control group. The researchers created a listening skills exam specifically for EFL students. The analysis was completed both prior to and following the trial. To improve the EFL listening abilities of first-year university students, the researcher created a teacher's manual. The experimental group was taught the applications, whereas the control group was

given standard tuition. The experimental group's listening abilities improved, according to the data.

Research ideas for future investigation

The following research directions are suggested by the study.

1. The effect of utilising various AI programs on learning additional languages.

2. More study is required to determine how to apply more AI applications to carry out various tasks that students use to learn EFL.

3. How employing artificial intelligence applications affects teachers' perceptions of using AI applications and how motivated students are to learn EFL.

Recommendations

The study's conclusions lead to the following suggestions being made:

1. Specialised training programs for teachers and students should be made available so they can exploit the AI interactive capabilities.

2. To ensure that teachers feel truly supported, For them to use the AI apps, there ought to be technical support available.

3. Teachers shouldn't be forced to use new technology tools uniformly or against their will.

4. Instructors should be more conscious of the drive pupils have to use different tactics in order to pique their interest in studying.

5. It is important to keep evaluating the applications, advantages, and difficulties of AI technology in the classroom.

6. More case studies and action research on the use of AI applications in education has to be carried out.

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